

Simplify each expression. Try to answer without your calculator if possible.

1. $|12 + 10| = |22| = 22$

2. $|-15 + 35| = |20| = 20$

3. $|-10 - 19| = |-29| = 29$

4. $|6 + (-18)| = |-12| = 12$

5. $|-7 + (-4) + 9| = |-2| = 2$

6. $|-6 - 12 + 16| = |-2| = 2$

7. $\frac{9-11}{2} = \frac{-2}{2} = -1$

8. $\frac{-12 - (-17)}{5} = \frac{5}{5} = 1$

9. $\sqrt{73 - 9} = \sqrt{64} = 8$

10. $\sqrt{-6 + 10} = \sqrt{4} = 2$

Solve the equation.

11. $3x - 9 = 12$
 $+9 +9$
 $3x = 21$
 $x = 7$

12. $\frac{x}{-6} = 50$
 cross mult.
 $x = -300$

13. $\frac{2x+5}{3} = -7$
 $2x+5 = -21$
 $2x = -26$
 $x = -13$

14. $10 = \frac{1-3x}{4}$
 $40 = 1-3x$
 $39 = -3x$
 $x = 13$

15. $5x + 11 = 7x - 15$
 $-5x -5x$
 $11 = 2x - 15$
 $26 = 2x$
 $x = 13$

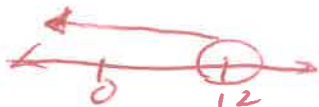
16. $3x - 41 = -4x + 15$

$7x = 56$
 $x = 8$

Solve the inequality. Graph the solution.

17. $\frac{4k}{4} < \frac{48}{4}$

$k < 12$



Name Key

18. $-6m > 36$

$m < -6$



19. $\frac{t}{2} \geq -11$

$t \geq -22$



20. $\frac{-x}{3} \leq \frac{7}{1}$

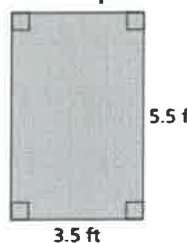
$-1x \leq 21$

$x \geq -21$



21. Find the perimeter and area of each figure:

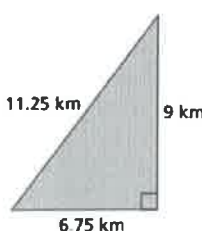
A.



$P = 2(5.5) + 2(3.5)$
 $= 18 \text{ ft}$

$A = (5.5)(3.5) = 19.25 \text{ ft}^2$

B.



$P = 11.25 + 9 + 6.75$
 $= 27 \text{ km}$

$A = \frac{1}{2}(6.75)(9)$
 $= 30.375 \text{ km}^2$

C.



$P = 4(6.5)$
 $= 26 \text{ yd}$

$A = 6.5^2 = 42.25 \text{ yd}^2$

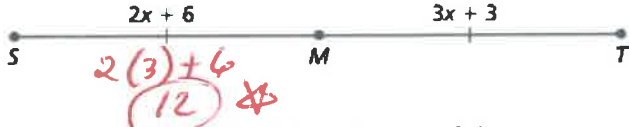
22. Find NP:



$24 - 17 = 7$

$x = 7$

23. Point M is the midpoint of $\overline{ST}$. Find the length of $\overline{SM}$. $2x + 6 = 3x + 3 \rightarrow 3 = x$



24. Find the coordinates of the midpoint if the endpoints of a segment are $(-2, 6)$ and $(5, 8)$.

$(\frac{-2+5}{2}, \frac{6+8}{2}) \rightarrow (\frac{3}{2}, 7)$

25. Find the coordinates of the midpoint if the endpoints of a segment are $(8, -3)$ and $(16, -4)$.

$(\frac{8+16}{2}, \frac{-3+(-4)}{2}) = (12, -\frac{7}{2})$

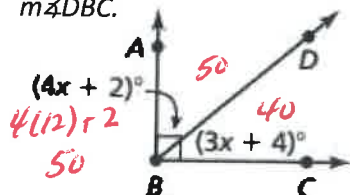
26. If the midpoint of a segment is (2, 5) and one endpoint is (1, 3), find the coordinates of the other endpoint.

$$(1, 3) \xrightarrow{\text{up 1}} (2, 5) \xrightarrow{\text{up 2}} (3, 7) \quad \star$$

27. If the midpoint of a segment is (-1, -4) and one endpoint is (5, -7), find the coordinates of the other endpoint.

$$(5, -7) \xrightarrow{\text{up 3}} (-1, -4) \xrightarrow{\text{up 3}} (-7, -1) \quad \star$$

28. Given that $\triangle ABC$ is a right angle, find $m\angle ABD$ and $m\angle DBC$.



$$\begin{aligned} 4x + 2 + 3x + 4 &= 90 \\ 7x + 6 &= 90 \\ 7x &= 84 \\ x &= 12 \end{aligned}$$

29. Evaluate the expression (without calculator):

$$6 \cdot 3 \div 2 - 5 + 7 \quad \underline{18 \div 2 - 5 + 7} = 9 - 5 + 7 = 11$$

Simplify the expression:

30. $9c + 18c - 19 \quad \underline{27c - 19}$

31. $4 - 7y - 9y + 3 \quad \underline{7 - 16y}$

32. $-4a - 6(7 - 5a) \quad \underline{-4a - 42 + 30a} = 26a - 42$

33. $7g + 2(3 - 2g) \quad \underline{7g + 6 - 4g} = 3g + 6$

34. $5(x + 2y) - 3(x + 9y) \quad \underline{5x + 10y - 3x - 27y} = 2x - 17y$

35. You begin to do push-ups every day after school.

You begin with five push-ups ^(on day 0) and increase your workout by one push-up each day. $y = 5 + 1d$

- a. How many push-ups do you complete on day three? $\underline{5 + 1(3) = 8}$

- b. How many push-ups do you complete on day five? $\underline{5 + 1(5) = 10}$

- c. When will you complete 12 push-ups? $\underline{12 = 5 + 1d} \Rightarrow \underline{7 = d}$

- d. When will you complete 15 push-ups? $\underline{15 = 5 + 1d} \Rightarrow \underline{10 = d}$

Evaluate (leave your answer in simplified radical form).

36. $\sqrt{45} = \sqrt{9 \cdot 5} = 3\sqrt{5} \quad \star$

37. $\sqrt{24} = \sqrt{4 \cdot 6} = 2\sqrt{6} \quad \star$

38. $\sqrt{160} = \sqrt{16 \cdot 10} = 4\sqrt{10} \quad \star$

39. $\sqrt{\frac{4}{9}} = \frac{2}{3} \quad \star$

40. $\frac{1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5} \quad \star$

41. $\frac{3}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} = \frac{3\sqrt{6}}{6} = \frac{\sqrt{6}}{2} \quad \star$

Write the negation of each statement.

42. The chair is wood.

The chair is not wood.

43. The photograph is *not* in color.

The photograph is in color

Simplify the expression. $(x+a)^2 = x^2 + 2xa + a^2$

44. $(x+4)^2 \quad \underline{(x+4)(x+4) \rightarrow x^2 + 8x + 16} \quad \star$

45. $(x-9)^2 \quad \underline{x^2 - 18x + 81} \quad \star$

46. $(3x+5)^2 \quad \underline{9x^2 + 30x + 25}$

Factor each expression:

47. $x^2 - 9x + 14 \quad \underline{(x-2)(x-7)}$

48. $x^2 - 3x - 28 \quad \underline{(x-7)(x+4)}$

49. $x^2 + 5x - 36 \quad \underline{(x+9)(x-4)}$

50. $x^2 - 25$

$(x+5)(x-5)$

51. $49x^2 - 100$

$(7x-10)(7x+10)$

52. $2x^2 + 5x - 12$ $(2x-3)(x+4)$

Factor and solve the equation:

52. $x^2 + 11x + 24 = 0$ $(x+3)(x+8) = 0$

$x+3=0$ $x+8=0$
 $x=-3$ $x=-8$

53. $x^2 + 4x - 12 = 0$ $(x+6)(x-2) = 0$

$x+6=0$ $x-2=0$
 $x=-6$ $x=2$

54. $5x^2 - 11x - 12 = 0$ $(5x+4)(x-3) = 0$

$5x+4=0$ $x-3=0$
 $x=-4/5$ $x=3$

55. You text at a rate of 35 words per minute. Your friend texts at a rate of 42 words per minute. How much faster does your friend text?

$42 - 35 = 7$ words/min faster

a. How many words can you text in 2.5 minutes?

$35(2.5) = 87.5$ words

b. How many words can your friend text in 2.5 minutes?

$42(2.5) = 105$ words

c. How many more words can your friend text in 2.5 minutes?

$105 - 87.5 = 17.5$ words

56. If $\angle 1$ is a supplement of $\angle 2$ and $m\angle 1 = 32^\circ$. Find $m\angle 2$.

$\angle 1 + \angle 2 = 180$

$180 - 32 = 148^\circ$

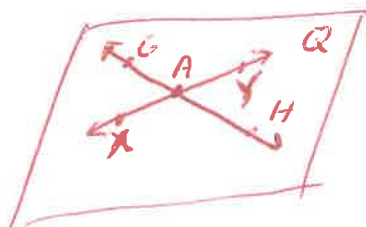
total 90

57. If $\angle 1$ is a complement of $\angle 2$ and $m\angle 1 = 32^\circ$. Find $m\angle 2$.

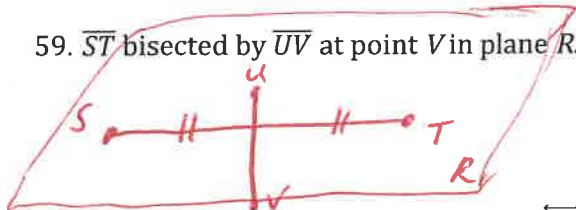
$90 - 32 = 58^\circ$

Sketch a diagram of the description:

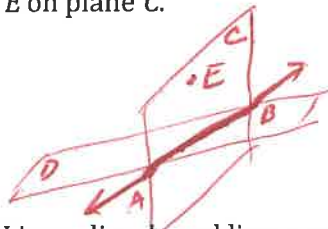
58. $\overleftrightarrow{GH}$ intersecting $\overleftrightarrow{XY}$ at point A in plane Q.



59. $\overleftrightarrow{ST}$ bisected by $\overleftrightarrow{UV}$ at point V in plane R.



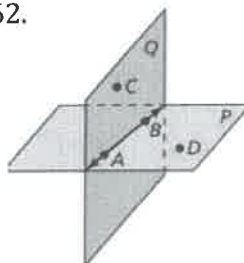
60. Plane C and plane D that intersect at $\overleftrightarrow{AB}$ and point E on plane C.



61. Line a, line b, and line c are coplanar, but do not intersect.



62.



What is the intersection of planes Q and P?

$\overleftrightarrow{AB}$

What plane is defined by points A, B, and C?

Q

63. Solve the equation: $-1(x+5) = 3[x+(2x-1)]$

$-1x-5 = 3(3x-1)$

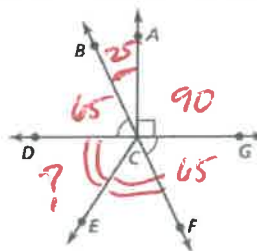
$-1x-5 = 9x-3$

$-2 = 10x$

$x = -\frac{1}{5} \leftarrow -\frac{2}{10} = x$

64. In the diagram $m\angle ACB = 25^\circ$ and $\overleftrightarrow{CE}$ bisects $\angle DCF$. Find $m\angle DCE$.

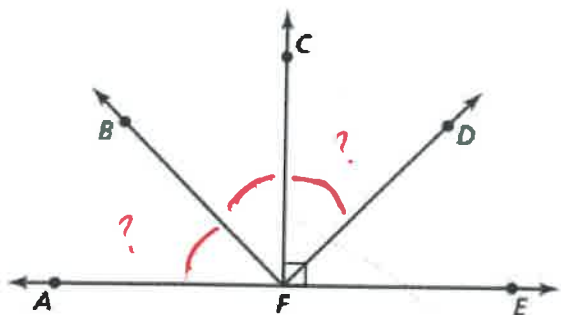
$90 - 25 = \angle DCB = 65^\circ$



$\frac{180 - 65}{2} = 57.5^\circ$

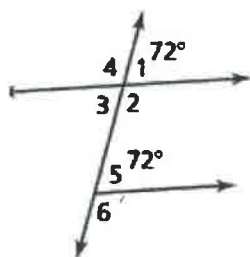
65. Write a two-column proof.

Given $\overline{BF}$ bisects $\angle AFC$ and $\angle CFD \cong \angle BFC$. Prove $\angle AFB \cong \angle CFD$.



Stmt	Reason
1. $\overline{BF}$ bisects	1. Given
2. $\angle AFB \cong \angle BFC$	2. Def bisector
3. $\angle CFD \cong \angle BFC$	3. Given
4. $\angle AFB \cong \angle CFD$	4. Transitive prop of equality

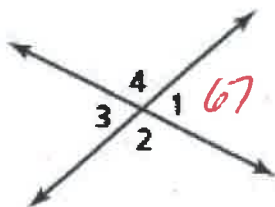
66. Identify the pairs of congruent angles in the figure. Explain how you know they are congruent.



$\angle 1 \cong \angle 3$ Vert $\angle 5$
 $\angle 1 \cong \angle 5$ Corresponding
 $\angle 2 \cong \angle 6$ supp. of $\angle 1$ or $\angle 5$
 $\angle 4 \cong \angle 2$ vert $\angle 5$

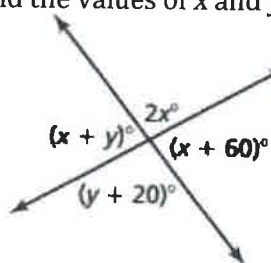
$\angle 1 \cong \angle 3 \cong \angle 5$ / $\angle 2 \cong \angle 4 \cong \angle 6$

67. Find the measures of angles 2, 3, and 4 given that $m\angle 1 = 67^\circ$.



$1 = 67$
 $2 = 113$
 $3 = 67$
 $4 = 113$

68. Find the values of x and y . Show your steps.

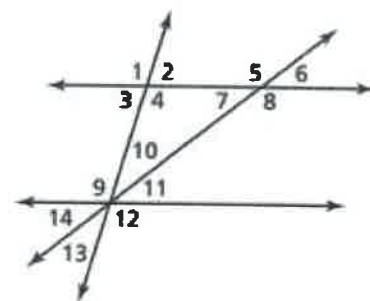


$y + 2x + 2x = 180$
 $3x + y = 180$
 $x + 60 + y + 20 = 180$
 $x + y = 100$

$3x + y = 180$
 $x + y = 100$
 $2x = 80$
 $x = 40$
 $3(40) + y = 180$
 $120 + y = 180$
 $y = 60$

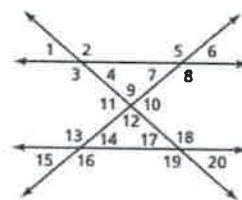
69. Classify the angle pair as corresponding, alternate interior, alternate exterior, or consecutive interior angles.

$\angle 4$ and $\angle 9$ alt int
 $\angle 1$ and $\angle 9$ corresp.
 $\angle 1$ and $\angle 12$ alt ext.
 $\angle 6$ and $\angle 11$ corresp.
 $\angle 4$ and $\angle 7$ consec. interior

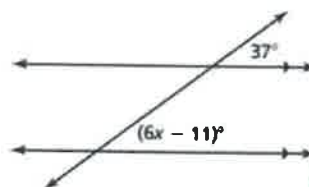


70. List all possible answers for each.

$\angle 1$ and 17 or 11 or 5 are corresponding angles.
 $\angle 13$ and 5 or 9 or 17 are corresponding angles.
 $\angle 14$ and 12 or 17 or 8 are consecutive interior angles.
 $\angle 4$ and 7 or 9 or 18 are consecutive interior angles.
 $\angle 7$ and 14 or 2 or 10 are alternate interior angles.
 $\angle 17$ and 4 or 10 or 16 are alternate interior angles.
 $\angle 6$ and 3 or 15 or 11 are alternate exterior angles.
 $\angle 18$ and 15 are alternate exterior angles.

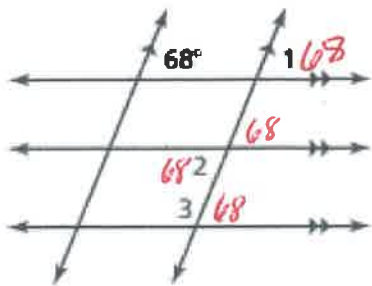


71. Find the value of x . Show your steps.



$37 = 6x - 11$
 $48 = 6x$
 $8 = x$

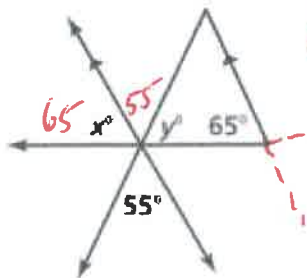
73. Find the measures of angles 2 and 3.



$$\angle 2 = 68$$

$$\angle 3 = 112$$

74. Find the values of x and y .

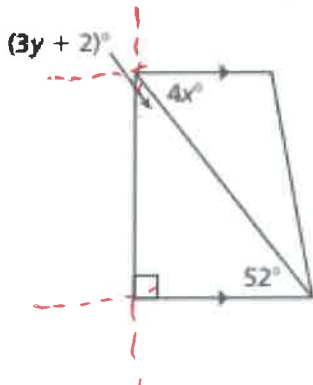


$$x = 65^\circ$$

$$y = 180 - 65 - 55$$

$$y = 60^\circ$$

75. Find the values of x and y .



$$4x = 52$$

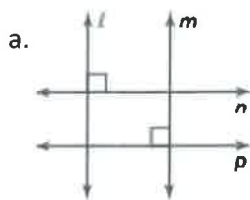
$$x = 13$$

$$3y + 2 + 52 = 90$$

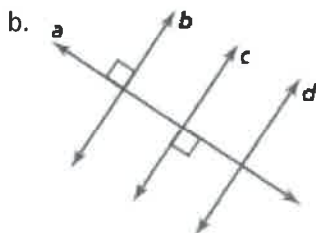
$$3y = 36$$

$$y = 12$$

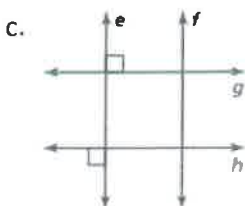
76. Determine which lines, if any, must be parallel.



none - no relationship between rt angles



rt angles are alt exts so $b \parallel c$



$g \parallel h$ b/c rt angles are alt exts.

77. Find the distance between A(-4, 5) and B(1, -2).

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(-2 - 5)^2 + (1 - 4)^2} = \sqrt{49 + 25} = \sqrt{74}$$

78. Write the equation of the line that has slope 5 and passes through (-10, 6).

$$y = y_p + m(x - x_p) \text{ (point-slope form)}$$

$$y = 6 + 5(x + 10)$$

79. Write the equation of the line that has the same slope as $y = -4x - 10$ and passes through (1, 8).

$$m = -4$$

$$y = 8 - 4(x - 1)$$

80. Write the equation of the line that has slope $\frac{1}{2}$ and the same starting point as $y = 6x + 4$.

starting pt = 4

$$y = \frac{1}{2}x + 4$$

81. Write the equation of the line through (-1, 4) that is parallel to $y = 7x - 9$.

$$\text{slope} = 7 \text{ so } m = 7$$

$$y = 4 + 7(x + 1)$$

82. Write the equation of the line that is perpendicular to $y = 7x - 9$ that passes through (-8, 2).

$$m = 7$$

$$m = -\frac{1}{7} \quad y = 2 - \frac{1}{7}(x + 8)$$

83. Write the equation of the line that passes through (5, 7) and (-2, 10).

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 7}{-2 - 5} = \frac{3}{-7} = -\frac{3}{7}$$

$$y = 7 - \frac{3}{7}(x - 5)$$

$$\text{or } y = 10 - \frac{3}{7}(x + 2)$$

84. What is the slope and y-intercept for the line $3x - 8y = 24$?

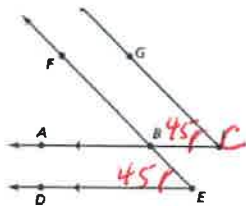
$$3x - 8y = 24$$

$$m = -\frac{A}{B} = -\frac{-3}{-8} = -\frac{3}{8} \quad b = \frac{C}{B} = \frac{24}{-8} = -3$$

85. Write a two-column proof:

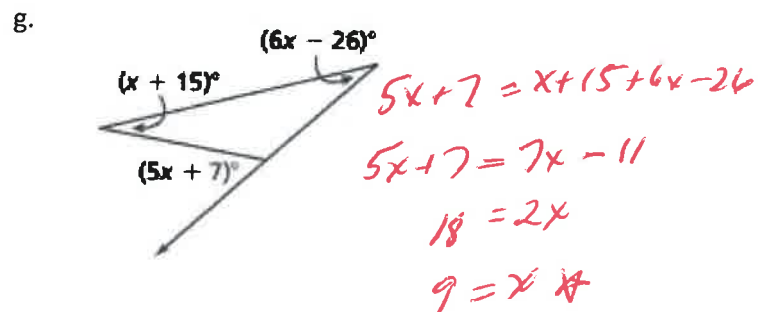
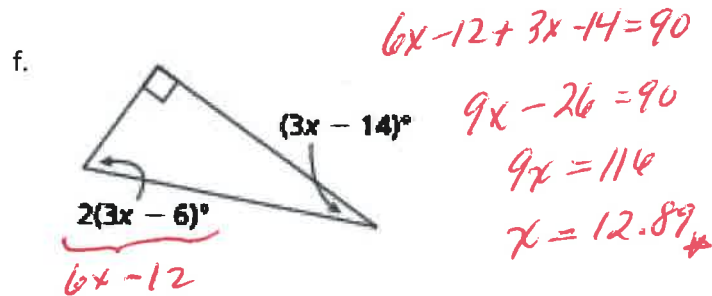
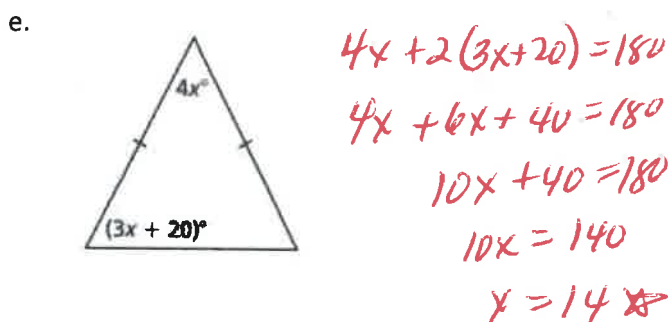
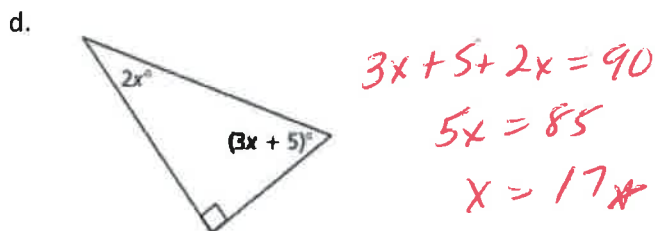
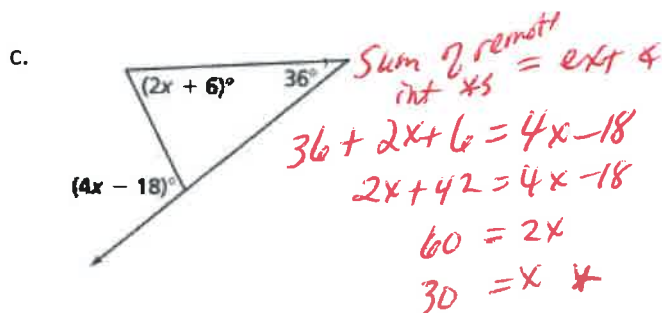
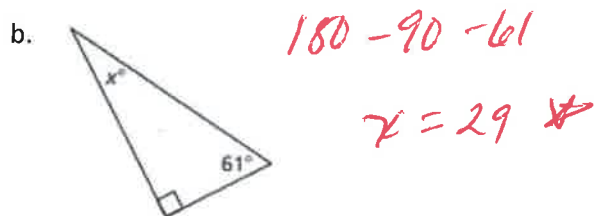
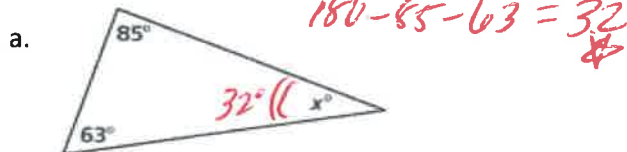
Given: $\overline{CA} \parallel \overline{ED}$, $m\angle FED = m\angle GCA = 45^\circ$

Prove: $\overline{EF} \parallel \overline{CG}$



Stmnt	Reason
1. $\angle FED \cong \angle GCA$	1. Given
2. $\angle FED \cong \angle FBA$	2. If lines $\parallel$ then corresp $\angle$ s
3. $\angle FBA \cong \angle GCA$	3. $\cong$ Trans. Prop
4. $\overline{EF} \parallel \overline{CG}$	4. If corresp $\angle$ s $\cong$ then lines $\parallel$

86. Find the value of x:

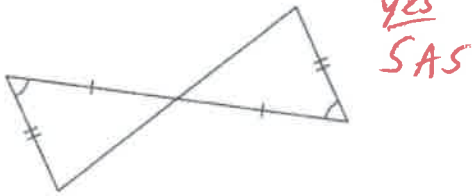


87. Fill in the blanks:

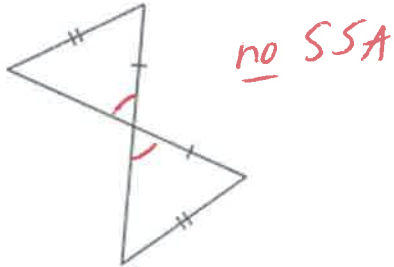
- A(n) isosceles triangle has two congruent sides.
- A(n) equiangular triangle has three congruent angles.
- A(n) scalene triangle has no congruent sides.
- The acute angles of a right triangle are complementary.
- The measure of a(n) exterior angle of a triangle is equal to the sum of the measures of the two nonadjacent interior angles.

88. Is there enough information prove that the triangles are congruent? If so, explain why or why not.

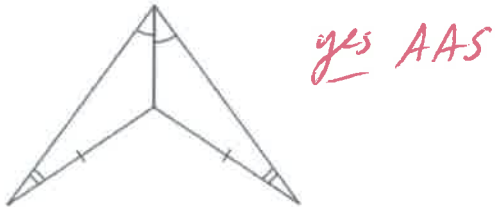
a.



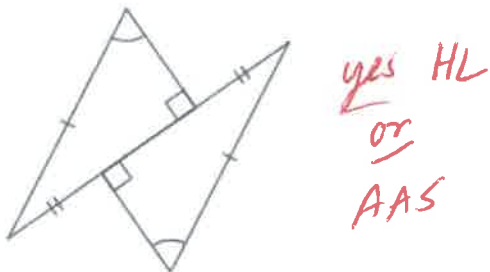
b.



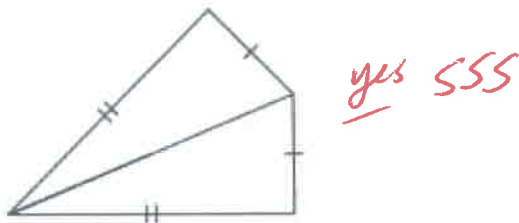
c.



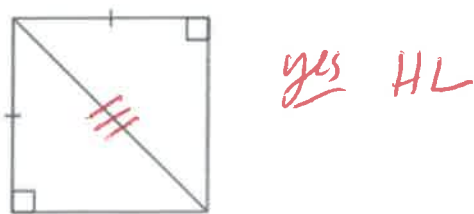
d.



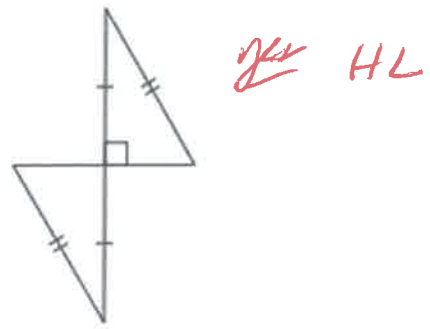
e.



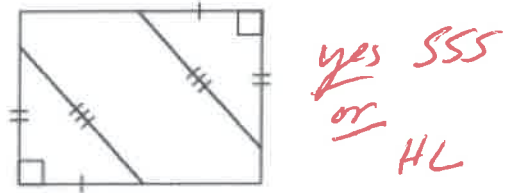
f.



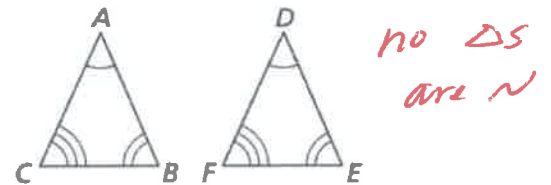
g.



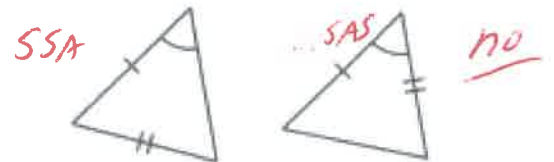
h.



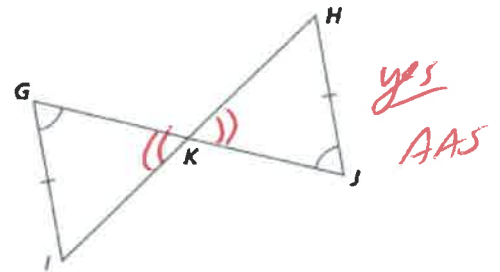
i.



j.



k.

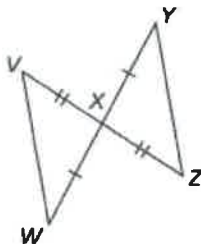


89. For what value(s) of x will the triangles be congruent?

$$AB = 3x + 4; \quad CB = 2 + 2x + 2\sqrt{2x+1}$$

$$\begin{aligned}
 3x+4 &= 2+2x+2\sqrt{2x+1} \\
 1x+2 &= 2\sqrt{2x+1} \\
 x^2+4x+4 &= 4(2x+1) \\
 &= 8x+4 \\
 x^2-4x+0 &= 0 \\
 x(x-4) &= 0 \\
 x=0 & \quad x=4
 \end{aligned}$$

90. Complete the missing reasons in the proof:



STATEMENTS	REASONS
$\overline{VX} \cong \overline{ZX}$	Given
$\overline{WX} \cong \overline{YX}$	Given
$\angle VXW \cong \angle YXZ$	C. Vert $\angle$ s are $\cong$
$\triangle VXW \cong \triangle YXZ$	D. SAS
$\angle V \cong \angle Z$	E. CPCTC

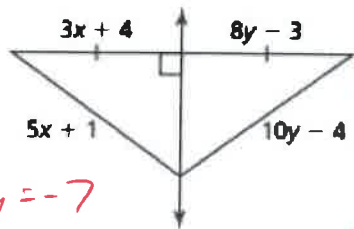
91. Write an equation of the perpendicular bisector of the segment with endpoints at A(-2, -2) and B(6, 0).

$$m = \frac{0 - (-2)}{6 - (-2)} = \frac{2}{8} = \frac{1}{4} \text{ so } \perp m = -4$$

$$\text{midpt} = \left(\frac{-2+6}{2}, \frac{-2+0}{2} \right) = (2, -1)$$

$$y = -1 - 4(x - 2)$$

92. Find the values of x and y.



$$3x + 4 = 8y - 3$$

$$3x - 8y = -7$$

$$5x + 1 = 10y - 4$$

$$5x - 10y = -5$$

$$x - 2y = -1$$

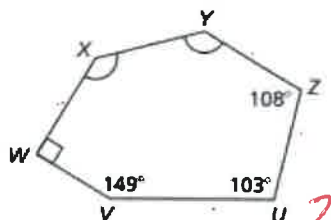
$$3x - 8y = -7$$

$$-3x + 6y = 3$$

$$-2y = -4$$

$$y = 2$$

93. Find the measures of $\angle X$ and $\angle Y$.



6 sides so total

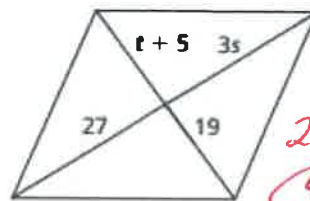
$$9 \text{ int } \angle s =$$

$$4(180) = 720$$

$$720 - 90 - 149 - 103 - 108 = 135$$

$$= 135^\circ$$

94. Find the value of t and s in the parallelogram:



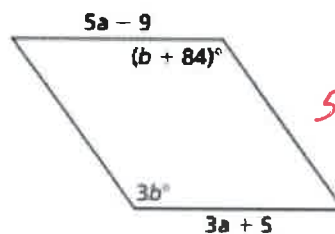
diag bisect each other

$$27 = 3s \quad t + 5 = 19$$

$$9 = s$$

$$t = 14$$

95. Find the value of a and b in the parallelogram:



opp sides + $\angle$ s are $\cong$

$$5a - 9 = 3a + 5$$

$$2a = 14$$

$$a = 7$$

$$3b = b + 84$$

$$2b = 84 \rightarrow b = 42$$

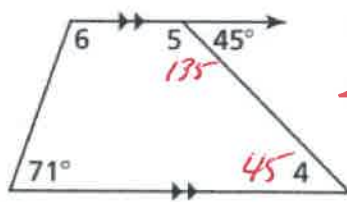
97. Find the lengths of the diagonals of rectangle JKLM if $JL = 3x + 4$ and $KM = 4x - 1$.

diag of rect are $\cong$

$$3x + 4 = 4x - 1 \text{ so } 3(5) + 4 = 19$$

$$5 = x$$

98. Use the diagrams to determine the measures of angles 4, 5 and 6.



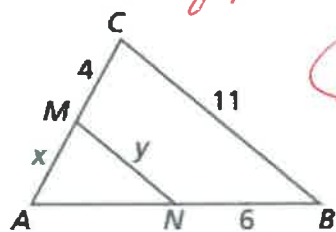
$$\angle 4 = 45^\circ$$

$$\angle 5 = 135^\circ$$

$$\angle 6 = 109^\circ$$

$$360 - 71 - 45 - 135 = 49$$

99. $\overline{MN}$ is a midsegment of $\triangle ABC$. Find the values of x and y .



half of 11 side

$$y = 5.5$$

$$\frac{x}{5.5} = \frac{x+4}{11}$$

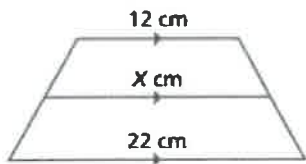
$$11x = 5.5x + 22$$

$$5.5x = 22 \rightarrow x = 4$$

100. Find the value of x .

$$\frac{12+22}{2} = x$$

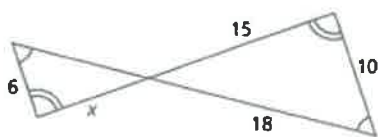
$$17 = x$$



101. Fill in the blanks:

- A trapezoid is a quadrilateral with exactly one pair of parallel sides.
- The parallel sides of a trapezoid are the bases.
- Base angles of a trapezoid are two possible = or unequal angles whose common side is a base.
- The nonparallel sides of are the legs of the trapezoid.
- If the legs of a trapezoid are congruent, then the trapezoid is an isosceles trapezoid.
- The median of a trapezoid is parallel to each base and its length is one-half the sum of the lengths of the bases.
- If a quadrilateral is a square, rhombus, kite, then its diagonals are perpendicular.

102. The triangles are similar. Find the value of x .



$$\frac{6}{10} = \frac{x}{15} \Rightarrow 90 = 10x$$

$$9 = x$$

103. In the diagram, $\triangle ABC \sim \triangle ADE$.

- a. Find the scale factor from

$$\frac{12}{21} = \frac{4}{7} \triangle ABC \text{ to } \triangle ADE.$$

- b. Find the value of x .

$$\frac{10}{12} = \frac{10+x}{21}$$

$$210 = 120 + 12x \rightarrow x = 7.5$$

- c. Find $m\angle ABC$.

$$180 - 40 - 32 = 108$$

- d. The perimeter of $\triangle ABC$ is about 42.4 units. Find the perimeter of $\triangle ADE$.

$$\frac{4}{7} = \frac{42.4}{x} \rightarrow 4x = 7(42.4) \rightarrow x = 74.2$$

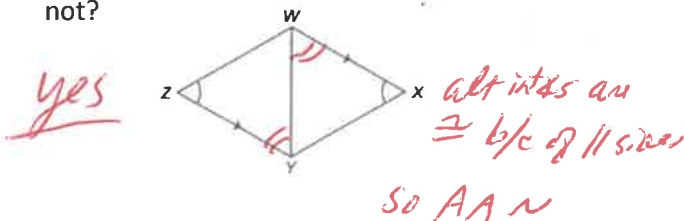
- e. The area of $\triangle ABC$ is about 71.75 square units. Find the area of $\triangle ADE$.

$$\frac{4}{7} \rightarrow \frac{16}{49} = \frac{71.75}{x} \quad 16x = 49(71.75) \quad x = 219.7$$

- f. Is $\overline{BC} \parallel \overline{DE}$? Why or why not?

yes - if correspond $\cong$ then segs are $\parallel$.

104. Are the smaller triangles similar? Why or why not?

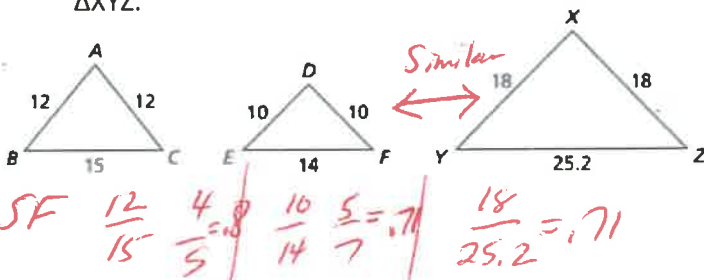


yes

alt int's are $\cong$ b/c of $\parallel$ sides

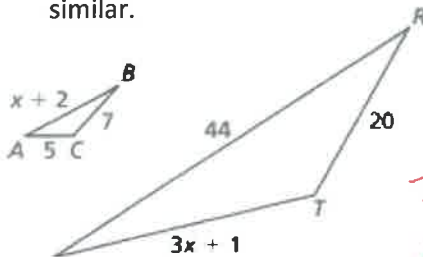
so $AA \sim$

105. Determine whether $\triangle ABC$ or $\triangle DEF$ is similar to $\triangle XYZ$.



$$SF \quad \frac{12}{15} = \frac{4}{5} \quad \frac{10}{14} = \frac{5}{7} \quad \frac{18}{25.2} = \frac{5}{7}$$

106. Find the value of x that makes the triangles similar.



$$\frac{2}{20} = \frac{x+2}{44}$$

$$7(44) = 20x + 40$$

$$268 = 20x$$

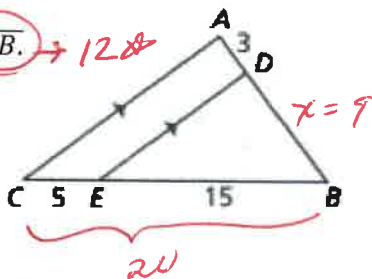
$$13.4 = x$$

107. Find the length of $\overline{AB}$.

$$\frac{5}{20} = \frac{3}{3+x}$$

$$60 = 15 + 5x$$

$$45 = 5x \rightarrow x = 9$$



108. Find the geometric mean between 9 and 20.

$$\frac{9}{x} = \frac{x}{20}$$

$$x^2 = 180$$

$$x = \sqrt{180} = \sqrt{36 \cdot 5} = 6\sqrt{5}$$

109. 10 is the geometric mean between 5 and what number?

$$\frac{5}{10} = \frac{10}{x}$$

$$5x = 100$$

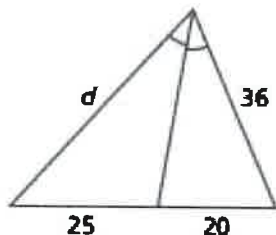
$$x = 20$$

110. Find the value of d .

$$\frac{25}{d} = \frac{d}{45}$$

$$d^2 = 1125$$

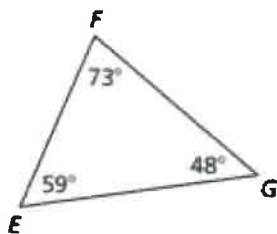
$$d = 33.54$$



111. List the sides of the triangle from shortest to longest:

$$48^\circ \quad 59^\circ \quad 73^\circ$$

$$\overline{EF} < \overline{FG} < \overline{EG}$$



112. Solve the equation: $(\sqrt{5})^2 + x^2 = 12^2$

$$5 + x^2 = 144$$

$$x^2 = 139 \rightarrow x = \sqrt{139} \approx 11.8$$

113. Solve the equation: $(5\sqrt{10})^2 - (\sqrt{2})^2 = x^2$

$$25(10) - 2 = x^2$$

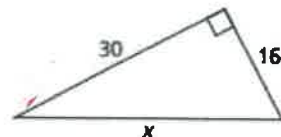
$$250 - 2$$

$$248 = x^2$$

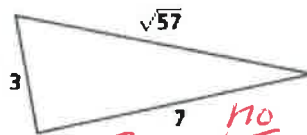
$$\sqrt{248} = x$$

$$x = 2\sqrt{62}$$

114. Find the value of x :

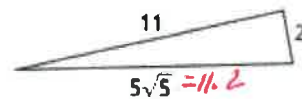


115. Tell whether each triangle is a right triangle.



$$3^2 + 7^2 \stackrel{?}{=} 57$$

$$9 + 49 = 58 \neq 57$$

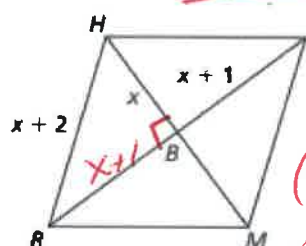


$$(5\sqrt{5})^2 \stackrel{?}{=} 11^2 + 2^2$$

$$25(5) \stackrel{?}{=} 121 + 4$$

$$125 \stackrel{?}{=} 125$$

116. If RHOM is a rhombus, find the value of x .



yes!
Diag are $\perp$ & bisect each other

$$(x+1)^2 + x^2 = (x+2)^2$$

$$x^2 + 2x + 1 + x^2 = x^2 + 4x + 4$$

$$x^2 - 2x - 3 = 0$$

$$(x-3)(x+1) = 0$$

$$x = 3 \quad x = -1$$

117. Solve the equation: $5\sqrt{2} = x\sqrt{3}$

$$(5\sqrt{2})^2 = (x\sqrt{3})^2$$

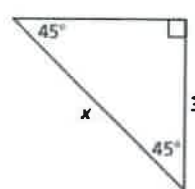
$$50 = 3x^2$$

$$x = \frac{5\sqrt{2}}{\sqrt{3}} = \frac{5\sqrt{6}}{3}$$

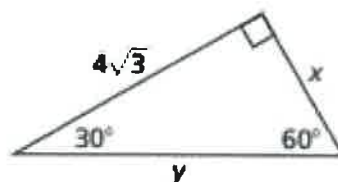
118. Find the values of x and y .

$$y = 3$$

$$x = 3\sqrt{2}$$

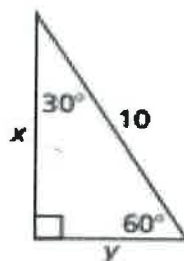


119. Find the values of x and y .



$$x = 4$$

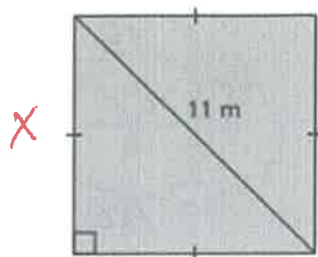
$$y = 8$$



$$y = 5$$

$$x = 5\sqrt{3}$$

120. Find the area of each figure. Round your answer to the nearest tenth.

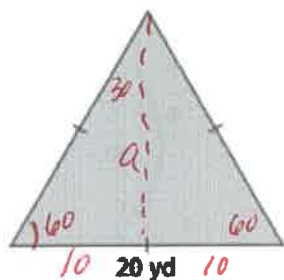


$$\text{Area} = \left(\frac{11}{\sqrt{2}}\right)^2$$

$$= \frac{121}{2}$$

$$x = \frac{11}{\sqrt{2}}$$

$$= 60.5$$



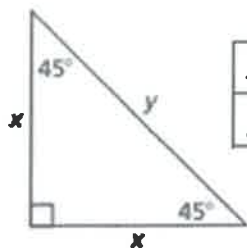
$$a = 10\sqrt{3}$$

$$\text{Area} = \frac{1}{2} (20)(10\sqrt{3})$$

$$= 100\sqrt{3}$$

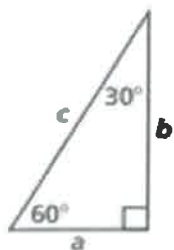
$$\approx 173.2$$

121. Complete each table. Write your answer in simplest radical form.



x	5	4	$\sqrt{2}$	$12\sqrt{2}$
y	$5\sqrt{2}$	$4\sqrt{2}$	2	24

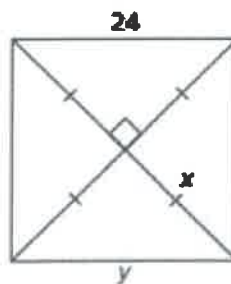
$$\frac{24}{\sqrt{2}} \rightarrow \frac{24\sqrt{2}}{2}$$



a	11	$3\sqrt{3}$	8	5
b	$11\sqrt{3}$	9	$8\sqrt{3}$	$5\sqrt{3}$
c	22	$6\sqrt{3}$	16	10

$$\frac{9}{\sqrt{3}} = \frac{9\sqrt{3}}{3} = 3\sqrt{3}$$

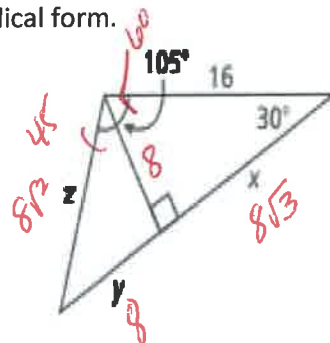
122. Find the values of the variables. Write your answers in simplest radical form.



$$24 = y$$

$$\frac{24}{\sqrt{2}} \rightarrow \frac{24\sqrt{2}}{2}$$

$$12\sqrt{2} = x$$

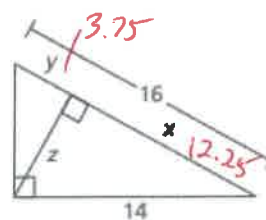


$$x = 8\sqrt{3}$$

$$y = 8$$

$$z = 8\sqrt{2}$$

123. Find the value of the variables:



$$\frac{x}{14} = \frac{14}{16}$$

$$196 = 16x$$

$$12.25 = x$$

$$y = 3.75$$

$$\frac{3.75}{z} = \frac{z}{12.25}$$

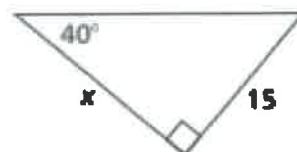
$$z = 6.8$$

124. Find the value of x:

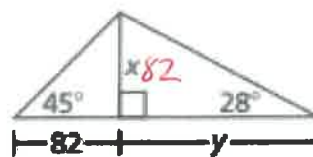
$$\tan 40^\circ = \frac{15}{x}$$

$$x = \frac{15}{\tan 40^\circ}$$

$$= 17.88$$



125. Find the value of the variables:

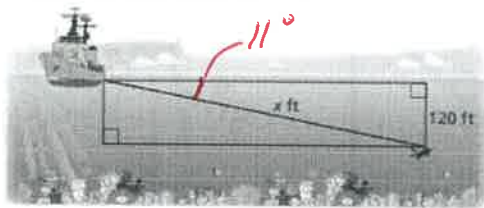


$$x = 82$$

$$\tan 28^\circ = \frac{82}{y}$$

$$y = \frac{82}{\tan 28^\circ} \rightarrow y = 154.22$$

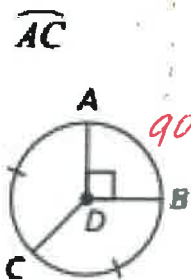
126. The angle of depression is 11° from the bottom of a boat to a deep-sea diver at a depth of 120 feet. Find the distance x the diver must swim up to the boat to the nearest foot.



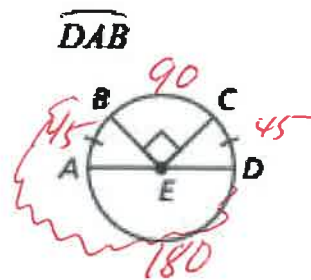
$$\sin 11^\circ = \frac{120}{x}$$

$$x = \frac{120}{\sin 11^\circ} \rightarrow x = 629 \text{ ft}$$

130. Find the measure of each arc.

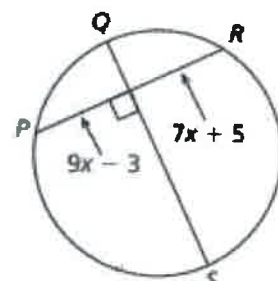
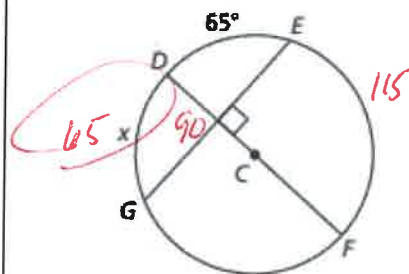


$$\frac{360 - 90}{2} = 135^\circ$$



$$180 + 45 = 225^\circ$$

131. Find the value of x .

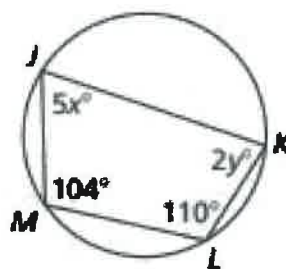


$$9x - 3 = 7x + 5$$

$$2x = 8$$

$$x = 4$$

132. Find the value of each variable:



Opp $\angle$ s are supp.

$$5x + 110 = 180$$

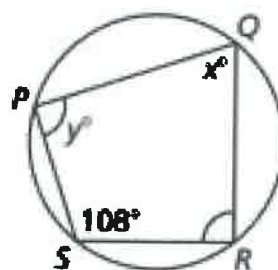
$$5x = 70$$

$$x = 14$$

$$104 + 2y = 180$$

$$2y = 76$$

$$y = 38$$



$$x + 108 = 180$$

$$x = 72$$

$$2y = 180$$

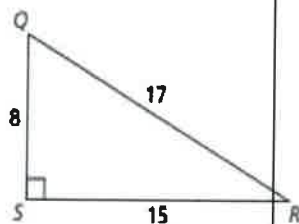
$$y = 90$$

127. Determine which of the two acute angles that has the given trigonometric ratio.

The sine of the angle is $\frac{8}{17}$. $\star R$

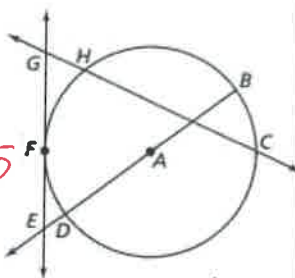
The cosine of the angle is $\frac{15}{17}$. $\star R$

The tangent of the angle is $\frac{15}{8}$. $\star Q$

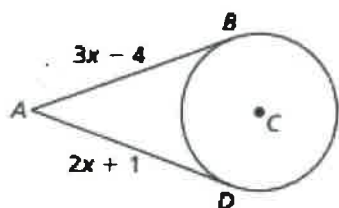


128. Use the diagram:

- Name the circle: $\odot A$
- Name two radii: $\overline{AD}, \overline{AB}$
- Name two chords: $\overline{CH}, \overline{BD}$
- Name a secant: $\overleftrightarrow{HC}$
- Name a tangent: $\overleftrightarrow{EG}$



129. Points B and D are points of tangency. Find the value(s) of x .



$$3x - 4 = 2x + 1$$

$$x = 5$$

tan to a $\odot$ from the same point are congruent